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A FEASIBILITY STUDY OF THYROID CANCER AMONG PATIENTS TREATED WITH I-131

by

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RESEARCH REPORT

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A FEASIBILITY STUDY OF THYROID CANCER AMONG PATIENTS TREATED WITH I-131

ABSTRACT

This study examined the feasibility of conducting a Canada-wide follow-up study of persons receiving I-131 before 1970, to see if current estimates of induction of thyroid cancer are well founded. It is concluded that such a study is not feasible due to the widespread destruction of old records, and the limited quantity of personal identifying information on those records that do still exist.

RÉSUMÉ

La présente étude de faisabilité traite du projet de mener une enquête au Canada parmi les personnes qui ont reçu de l'iode 131 avant 1970 pour déterminer si les calculs estimatifs de provocation du cancer de la thyroïde sont justes. L'étude conclut que l'enquête n'est pas possible parce que de très nombreux dossiers ont été détruits et que les dossiers qui restent manquent de renseignements personnels.

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1. Introduction

The stated objective of this feasibility study was to "carry out a feasibility study to determine availability of satisfactory identifying information about the thyroid patient, dose received by the thyroid due to I-131 administration and to assess the work involved in converting these data into computer readable records".

The main interest of the study was to see if a Canada-wide study was likely to be both feasible and reasonably cost-effective, in which persons who had received relatively low doses of I-131 for diagnostic purposes could be traced via computerized record-linkage at Statistics Canada to see whether they had subsequently developed an excessive number of thyroid cancers, and whether this excess was (i) dose-related, (ii) consistent with current estimates of the carcinogenicity of I-131, which is based largely on other types of radiation (gamma, x, etc) to the thyroid.

Important questions that were consciously not addressed in this study included the issue of what would constitute a suitable control group (e.g. general population?), and the associated problems of possible systematic bias. This could arise because (i) the thyroid had at one time been (or suspected of being) "abnormal" in some way -- such abnormality conceivably could be correlated either positively or negatively with the subsequent development of cancer, irrespective of radiation during diagnostic investigation: (ii) the earlier experience of suspected thyroid abnormality leading to either the patient or attending physician, or both, being particularly curious about the subsequent health of the thyroid gland, since the frequency of finding neoplastic nodules in the thyroid appears to vary markedly with the vigour with which they are sought.

The potential importance of the full-scale study is due largely to the meagre amount of existing evidence in human populations. Only one study of diagnostic doses (as distinct from therapeutic, which tend to destroy the gland and thus possibly reduce the possibility of subsequent thyroid cancers) has previously been reported. This was from Sweden and involved the follow-up of 10,000 individuals. (Holm et al, JNCI, 1980, p.1055).

As a background to what was actually found in this feasibility study it is of interest to identify what might have been possible with a Canada-wide study, had all the necessary criteria been met.

It had been decided that 1970 was a convenient cut off date for an I-131 study, since it provided an adequate latent interval for cancer to appear. Furthermore, the use of I-131 has declined since 1970 because of the use of other radionuclides.

Based on the records of the Vancouver General Hospital, a crude estimate of the number of Canadians who had been given only low, diagnostic doses of I-131 by the year 1970 is approximately 230,000 (see Appendix B). In addition, some 20,000 individuals probably received therapeutic doses involving approximately 5000 micro-curies of iodine compared to doses in the order of 15 to 90 micro-curies in the diagnostic procedures.

The linkage process at Statistics Canada has been shown to have an accuracy of up to 90% or better when mortality data are being searched with adequate identifying information. For thyroid cancer, linkage to the national cancer incidence data bank would seem more appropriate than mortality, since a substantial proportion of thyroid cancers are not lethal. Even if only a 70% linkage could be obtained with incidence data, this would still represent a study some 10 - 15 times larger than the Swedish study referred to earlier.

An estimate of the likely cost of such an 'ideal' Canada-wide study is also useful: -

(a) Coding of records (based on VGH experience)
- approximately 20 per hour
- say 200,000 records, = 10,000 hours
- at say $10 per hour (inc fringe benefits) = $100,000

(b) Key-punching
- approximately 50 per hour (=4,000 hours)
- at say $15 per hour = $ 60,000

(c) Linkage procedure at Statistics Canada (approximately) = $ 80,000

(d) Projector director (including travel) = $ 50,000

Total = $290,000

If only half the predicted number of records were available , the cost would be approximately $150,000.

In a less than ideal situation, coding costs could rise significantly -- e.g. if more than 1 source record had to be located and coded for each patient the coding rate might well drop to 4 or 5 per hour, increasing the above coding costs from $100,000 to $320 - 400,000, and the total cost to over $500,000.

Thus given a straightforward data-coding process, the full-scale study could yield a very major addition to knowledge of the carcinogenicity of low doses of I-131 for a relatively modest expenditure. However, the predicted cost is very sensitive to the ready availability of adequate patient data.

This latter issue is the question being addressed by the present feasibility study.

2. Methods and Results

Note that Methods and Results are presented together, because the methods changed continuously as the investigation proceeded, due to the unexpected results that were obtained at various stages. Furthermore, there proved to be at least four separate issues that needed to be considered: Availability of records; Adequacy of records; Ability to detect subsequent cancers of thyroid; Generalisability of results to entire country. Consequently, within the Methods

and Results section there are four subsections.

2.1 Availability of Records:

In certain respects Vancouver proved to be an ideal location in which to test the feasibility of a large scale follow-up study of I-131 patients. Not only had the Vancouver General Hospital been one of the first centres in Canada to begin using I-131 for diagnosis and therapy of thyroid disorders, but by 1970 (the proposed final year of the study), this was still the only centre of I-131 use in the entire province.

In addition, an initial cursory inspection of the record-storage vaults of the hospital was very encouraging, in that each I-131 patient's records had been stored in a single manilla folder and dates of first visits were found to go back as early as 1953 (approximately the first year in which I-131 was used in Canada). Furthermore, all thyroid cases had been filed together and numbered consecutively at first visit, so that it was very easy to locate each chart (no need to sort through numerous charts containing information on patients who had received other types of investigation), and the consecutive numbering made it very easy to establish if any files were missing.

An initial coding sheet was drawn up (example in Appendix C), with the idea that once a thorough sampling of available records had been done, it would be re-drafted in a more appropriate format for key-punching. It was also anticipated that there might be differences in the information available at other centres, and that the final coding sheet should be appropriate for all centres.

As initial coding of the VGH files progressed, it was found that although many charts had been stored sequentially, there were substantial "blocks" of charts that were out of order. It was therefore necessary to tabulate all the charts that were present, and then to arrange the numbers into a proper sequence so that true gaps could be identified.

The result of this activity is summarized in Appendix A, and it can be seen

that in fact there had unfortunately been a substantial loss of records: only 11% were found between 1953 and 1963, and none at all could be found from 1963 to 1970.

Upon enquiry, it appeared that the retention of old outpatient files had been based primarily on space-needs: as space was needed for new charts, batches of old ones would be destroyed.

As a matter of interest, it can be estimated that approximately 25,000 persons would have received I-131 at the VGH before 1970 (13,893 to 1963, plus 11,548 from 1963 to 1970 -- see Appendix B). No more than 10% of these are likely to have received therapy also, so that there were about 23,000 persons who received diagnostic doses only.

Sometimes the destruction of old files had been selective, and indeed most of the files remaining for the years 1953 to 1963 were of patients who had received therapeutic I-131 as well as diagnostic. In passing it should be noted that in almost all cases, therapy had been carried out on an in-patient basis, and the hospital has retained on micro-fiche all in-patient records. However, this is of little value in the present situation since the primary objective of the follow-up study would be to trace patients who had received <u>low</u> i.e. diagnostic doses. Where a patient has received therapy -- as in Appendix C -- the therapy dose is typically some 50 to 200 times greater than the diagnostic dose.

2.1.1 <u>Private Office Records</u>:

Faced with this major gap in the hospital records -- indeed a virtually complete loss of records of "diagnosis-only" patients -- it was decided to attempt to obtain the missing records from the office records of private physicians.

Initially, it appeared that this would be a simple and very viable alternative, since there had only been three physicians involved in the administration of I-131 to patients at the VGH before 1970.

All these physicians were very cooperative, and kindly gave permission for the research assistant to examine their office files on the explicit understanding that strict confidentiality would be observed. In one office, all records prior to 1966 had been destroyed, but in the other two all records had been kept back to the time that the physicians had started their practices, -- 1952 and 1959 respectively.

Unfortunately, it transpired that although these physicians were the only ones involved in administering I-131 to patients at the VGH clinic, patients could be referred directly to the clinic by any physician. Consequently, the only patients with a record at the private office were those who had been seen "in consultation" -- i.e. referred for a specialist examination and opinion in addition to receiving the diagnostic test. The three physicians estimated that they would therefore probably only have records on some 20-30% of all patients given diagnostic doses of I-131 at the VGH clinic.

To make a more direct estimation of this fraction, all records were searched for the year 1962 at the offices of the two physicians who still had files for that year. The results were as follows:

Dr. A. 278
Dr. C. 112
VGH patients (approx) 1800...(see Appendix A)

Although we have no direct way of measuring the number of patients seen during 1962 by the third physician (Dr. B.), a reasonable estimate would be 200, since his practice began in the years between the other two. If we assume 200, the combined figures would have been 590, or 33% of the 1800 patients seen at the VGH clinic.

Assuming that these proportions remain the same, then the percentage of patients actually traceable through office files would be about 22% up to 1966 (390/1800), and about 33% from 1966 to 1970 (590/1800), since Dr. B's

files are available from 1966.

Thus, of the 25,440 persons estimated to have received I-131 at the VGH before 1970, we could probably locate about 6900 (27%) through the office records of these 3 physicians (22% of 13,893 = 3056, plus 33% of 11,548 = 3810, for a total of 6866).

However, it must be noted that the coding process was much slower with the physician's records, since the files of thyroid patients had not been kept separate from those with other disorders. It was therefore necessary to search through each folder to determine whether the patient had had a thyroid problem before being able to code an entry, so that the number of thyroid cases coded per hour of clerical time dropped from about 20 per hour to only 4 or 5 per hour. This would of course substantially increase the cost of the operation. Also, as will be discussed later, the amount of information was usually less than in the hospital file -- notably the actual dose of I-131. This was rarely recorded in the consultation report, but was always recorded in the hospital record.

Although it would almost certainly prove prohibitively expensive, for completeness it should be mentioned that it would be theoretically possible to identify more than 27% of I-131 patients by requesting permission to examine records of all physicians, especially internists, and especially those in the greater Vancouver area.

Before concluding this section it is of interest to note that among Dr. A's I-131 patients the proportion that subsequently received a therapeutic dose of I-131 was 7.4%, while among Dr. C's patients the figure was 6.6%. The similarity of these two figures suggests that it is probable that at least 90% of the patients seen at the VGH received diagnostic doses only.

2.2 Adequacy of Records

Hospital records almost always had the patient's full name (not just initials), address, and age - but never day and month of birth. The hospital data also always included the dose of I-131 administered and

percentage uptake at 24 hours, occasionally also at 4 hours. The record would very rarely have estimated weight of thyroid.

Records at physician's offices were essentially the same, the main difference being that although the % uptake was usually given, the dose of I-131 was rarely mentioned. However, at any particular period of time the dose of I-131 administered for diagnostic purposes was fairly standard, so that the dose given can be estimated quite accurately (within 5 or 10%).

The major defect from the point of view of subsequent record linkage to the national cancer incidence file was the same in both sets of data - the absence of day and month of birth.

In an attempt to obtain an exact date of birth, contact was made with a number of the insurance agencies (about 70% of the patients had been insured. The large number of different companies encountered is shown in Appendix D). It was hoped that original application forms might have been retained, or that at least some link could be made from the old commercial insurance plan number to the current government-run Medical Services Plan.

Unfortunately, these efforts proved fruitless, since virtually all data of past insurance plans had been destroyed. Furthermore, even now, apparently only month and year of birth - not day - are recorded.

Another route that was explored was through the finance records of the hospital, but again this yielded no further information on exact date of birth.

Similarly the card index available in the Department of Nuclear Medicine was both incomplete for earlier years, and carried very little information other than name and address.

2.3 Ability to Detect Subsequent Cancers of the Thyroid

The original plan for this follow up study had envisioned making use of the sophisticated computer record-linkage programme that has been developed at

Statistics Canada to identify those persons who had at some time received a diagnostic dose of I-131 and who had subsequently developed cancer of the thyroid gland.

The linkage programme at Statistics Canada has performed well in mortality studies, in which fact-of-death and cause-of-death has been sought for a cohort of persons with some exposure of interest (e.g. uranium miners). Matching accuracy of over 90% has been achieved if several sensitive personal identifying factors such as full names, exact date of birth and mother's maiden name have been available in the exposed's records, since these items are almost always present on the death certificate. In doubtful cases, other information such as street address can also be useful, but this involves a manual comparison with the original death certificate, since street address is not coded into the death certificate computer tape. This manual addition tends to increase the cost considerably.

Unfortunately it appears that the likely success rate of linkage to the incidence file would be poor, even if exact date of birth was available in the I-131 records, because of the far from universal appearance of this information in the central cancer file. (See Appendices A and B, kindly supplied by Ms. Martha Smith of Statistics Canada). Thus for Canada as a whole less than 80% of the cancer registrations had this information in 1978, and in British Columbia the figure was less than 20%. While there is reason to believe that this situation is improving, and that in the case of B.C. data over 50% of registrations, even for past years, will soon have full date of birth, the chance of an accurate match is obviously much less for cancer incidence than mortality.

Another worrisome aspect of the present cancer incidence data is the low proportion of registrations with a second given name (about 45% for Canada, and virtually zero for B.C.).

As mentioned earlier, incidence is particularly important in cancer of the thyroid, since it is often a relatively harmless type of cancer. Overall

mortality rates of thyroid cancer in Canada and other countries are about 20 to 40% of incidence rates (Ron and Modan, "Cancer Epidemiology and Prevention", 1982, p.840). However, the case fatality rate of radiation-induced thyroid cancers is probably lower than this, since some 89% of radiation-induced cncers are papillary tumours, compared to approximately 80% of spontaneous thyroid cancers. Well-managed papillary cases have a mortality rate of less than 5% (BEIR, 1980;355). The more malignant anaplastic or meullary forms of thyroid cancer do not appear to be induced by radiation. Mortality is thus a relatively insensitive measure of thyroid cancer incidence particularly of radiation-induced cancer.

2.4 Generalisabililty of Results

While the feasibility study was being conducted in Vancouver, contact was made with other centres involved with nuclear medicine. This was done in two ways: first, by a letter to all members of Nuclear Medicine Association explaining the proposed follow-up study and asking for information on pre-1970 records (Appendix F); second, by telephone calls to major centres that were known to have been active in nuclear medicine well before 1970. Dr. R. Morrison was responsible for most of the telephone contacts, since he knows the individuals in charge of the various Nuclear Medicine departments. The findings were:

(1) Montreal - no records retained from before 1970.
(2) Toronto - no direct information, but likely similar to Montreal.
(3) Ottawa - (began 1957) all records retained. No date of birth.
(4) London - completeness not known. No date of birth.
(5) Winnipeg - early years not kept. No date of birth.
(6) Edmonton - first used 1965. No date of birth.

Thus the pre-1970 Vancouver situation is about average for Canada as a whole.

3. Discussions and Conclusions

Unfortunately, the destruction of old records and the lack of exact date of birth on those records that have survived make the idea of computer-linkage to either the national cancer incidence register or the national mortality data bank virtually impossible.

An alternative method of follow up would be to attempt to actively trace the present whereabouts of patients given I-131 in earlier years. However, experience with this method of follow-up has shown it to be very expensive and relatively inefficient.

It also increases the chances of bias, since individuals who have subsequently become ill are likely to be more easy to trace (through hospital records, etc). In any case the number of individuals who could be identified from existing records in hospitals or physician's offices is likely to be only a small fraction of the total actually exposed.

Consideration should be given to addressing the question from the oppposite direction, i.e. a case-control study, in which cases of thyroid cancer and suitable controls are questioned about prior exposure to I-131.

Such a study could be expected to yield a relatively accurate estimate of relative risk and an indirect measure of the burden of I-131 induced cancers. Provided that the typical dose of I-131 used for diagnostic purposes can be established for various time periods in each location, it should be possible to estimate induced cases per unit dose with relative accuracy ($\pm$ factor of 2?), assuming, of course, a linear dose-resonse relationship with no threshold.

In this way, the original objective of the major study for which this was the initial, feasibility, stage could be realised, i.e., the quantification of the carcinogenic burden created by low doses of I-131 by direct measurement of its effect on human beings, rather than indirect estimation based on other species or other forms of radiation exposure.

Consideration should also be given to instituting a system whereby a certain minimum amount of information on nuclide-receiving patients is retained for an indefinite period , so that 20 years from now we do not face the same inability to carry out a follow-up study of hospital patients given a radionuclide.

Appendix A

NUMBERS OF CHARTS OF PATIENTS RECEIVING I-131 FOUND AT THE VANCOUVER GENERAL HOSPITAL.

Dates (Approximate)	Chart Nos.	Expected No. of Charts	Actual No. of Charts	%
April - Dec. 1953	14232-14389	157	25	16
Jan. - Dec. 1954	14405-14744	339	27	8
Jan. - Dec. 1955	14802-15699	897	76	8
Jan. - Sept. 1956	15730-16533	803	383	48
Sept. 57 - Dec. 57	17833-18255	422	17	4
Jan. - Nov. 1958	18413-19553	1140	67	6
	19876-19893	18	17	94
March - June 1959	20082-20675	593	500	84
Nov. 59 - Dec. 1960	21293-23160	1867	136	7
Jan. - Dec. 1961	23321-25163	1842	116	6
Jan. - Dec. 1962	25218-26986	1768	106	6
Jan. - Aug. 1963	27010 -28125	1115	92	8
Possible Total (1953-1963)	13,893		1562	11.2%

Appendix B

ESTIMATES OF NUMBERS OF PATIENTS EXPOSED TO I-131 IN DIAGNOSTIC DOSE

1. Annual number of new patients (from Appendix 1):

   Jan 1954 - Dec 1955 = 1294, = 647 per year

   Jan 1961 - Dec 1962 = 3665, = 1833 per year

   (Note: number of procedures was greater than this, because many patients had more than one diagnostic test, and in those that had therapy there was sometimes more than one therapeutic dose).

2. Last record found was August 1963.

   Assuming 1961-1962 rate of 1833 per year persisted to 1970, there would have been a further 11,548 patients seen (6.3 x 1833).

   Added to the 1953-1963 total of 13,893 (Table 1) gives a total figure of 25,440 by 1970.

   If 10% of these had therapeutic doses of I-131, then the number of patients receiving diagnostic doses only would have been about 22,896.

3. Between 1953 and 1970 British Columbia had about 10% of the total Canadian population. Extrapolating the B.C figures to the whole of Canada (no allowance for different age distributions, variation in accessibility, etc.) would give a Canadian total of 228,960 patients exposed to diagnostic doses of I-131 by 1970.

HCZ84

APPENDIX C

SOURCE VGH FILE # 25747

Name: DOE (Last) Jane (First)

Address: 123 Main St. Vanc. Tel: AB 1|2345.

Age: 69 D of B: 1/1/ (D M Y) Insurance # C.P.R. Employees RTD/123456.

Height: 5'2" Weight: 120

Referring Doctor(s) 1. A.B. Smith, 456 Brown St., Vanc (Name) (Address)

2. _____

Hospital Doctor: McIntosh. (Hospt Chart # _____)
Unit # 987654

Provisional Diagnosis:

1. Thyroid: Graves' disease. (Nodule?)____ (Where?)____
(Est. Weight 100-150gm.

2. Other: —

Use of I_{131}

Date	Dose	U/S/T	% 4 hour	% 24 hour	Ref. Dr.	Hosp. Dr.
12.12.62	16.36 x3 mc	S	-	67	Smith	M.
14.12.62	4.9 mc	T	-	-	"	"
13.3.63	16.0 mc	U	-	41	"	"
15.3.63	4.0 mc	T	-	-	"	"

Comments: (Note if not I_{131} / "NaI, carrier free" / oral)

Source: Either Vancouver General Hospital records (VGH) or records of one of three private physicians.

Referring Doctor(s): The name and address of the referring doctor was recorded in case there was a need to refer back to him or her. Space was provided for more than one, because in some cases, patients had been seen over a number of years, and their referring doctor had changed.

Est. Weight: Very few records contained any estimate of thyroid weight.

U/S/T: Uptake, Scan, or Therapy.

Comments: In addition to providing space for additional information that might be relevant, the words in brackets (Note if not ....etc) was intended to remind the coder to certify that these three items were always as stated in the records first examined.

Appendix D

A list of medical insurance plans that were encountered in patients' records, which were mainly pre-"Medicare". In each case the patients would have an insurance reference number, so that a claim for payment could be made by the hospital and physician.

M.S.A. (Medical Services Association)

M.S.I. (Medical Services Insurance)

B.C. Government Employees

Regina/Saskatoon Group Medical Services

D.V.A. (Department of Veteran's Affairs)

O.A.P. (Old Age Pension

C.P.R. Medical Plan

Fidelity Health Association

Medical Services (Alberta) Inc.

Department of Health & Welfare (Social Assistance)

CPMA

Fraser Valley Medical and Dental Society

Woodwards

CNR Medical Plan

British Pacific Co

C.V. & C. (Credit Union and Co-operative)

Can. Pacific Alberta Blue Cross.

Great West Life

Sun Life

S.A.M.S.

Telephone Employees

B.C. Teachers

Vancouver Teachers' Medical

Zurich Insurance

London Life

Blind Pension

United Home Securities CPEMA

02/10/82

CANCER INCIDENCE DATA.

PROVINCE : CANADA TOTAL

YEAR : 1978

DATA ITEM	VALID	BLANK	INVALID	TOTAL	% (VALID)
S.I.N.	416	55855	18	56289	0.73
PREV. REG. CASE #	1245	51002	4042	56289	2.21
SURNAME	56289	0	0	56289	100.00
FIRST GIVEN NAME-INITIAL	56289	0	0	56289	100.00
-REMAINDER	56204	85	0	56289	99.84
SECOND GIVEN NAME-INITIAL	25716	30573	0	56289	45.68
-REMAINDER	24355	31934	0	56289	43.26
MAIDEN NAME - FEMALES	12303	16074	0	28377	43.35
- MALES	9824	18088	0	27912	35.19
- ESKIMO (M&F)	0	0	0	0	0.00
RESIDENCE - PROVINCE	56289	0	0	56289	100.00
- COUNTY	56004	285	0	56289	99.49
- SUBDIVISION	27490	28799	0	56289	48.83
- TYPE	6291	49998	0	56289	11.17
BIRTHPLACE - CONTINENT	559	55723	2	56289	0.99
- COUNTRY	561	55728	0	56289	0.99
- PROVINCE	17004	39285	0	56289	30.20
- COUNTY	1398	54891	0	56289	2.48
- SUBDIVISION	0	56289	0	56289	0.00
SEX	56289	0	0	56289	100.00
BIRTHDATE - YEAR	56247	42	0	56289	99.92
- MONTH	44541	11748	0	56289	79.12
- DAY	43373	12916	0	56289	77.05
MARITAL STATUS	12806	34890	8593	56289	22.75
AGE	56286	3	0	56289	99.99
DIAGNOSIS	56289	0	0	56289	100.00
DATE-DIAG. - YEAR	0	0	56289	56289	0.00
- MONTH	42587	13702	0	56289	75.65
SHOP CODE	24429	25414	6446	56289	43.39
STATUS (DEAD AT NOTIF.)	0	56289	0	56289	0.00
V.S. INDICATOR	56289	0	0	56289	100.00
DEATH REG. - PROV.	1384	54905	0	56289	2.45
- NUMBER	1384	54905	0	56289	2.45
INSURANCE NUMBER	12620	40943	2726	56289	22.42
PREV. REG. CASE #	2445	44077	0	46522	5.25

Appendix E

PRESENCE OR ABSENCE OF VARIOUS PERSONAL IDENTIFYING INFORMATION ON THE NATIONAL CANCER INCIDENCE REPORTING SYSTEM.

02/10/82 CANCER INCIDENCE DATA.

PROVINCE : BRITISH-COLUMBIA YEAR : 1978

DATA ITEM	VALID	BLANK	INVALID	TOTAL	% (VALID)
S.I.N.	0	12861	0	12861	0.00
PREV. REG. CASE #	0	12861	0	12861	0.00
SURNAME	12861	0	0	12861	100.00
FIRST GIVEN NAME-INITIAL	12861	0	0	12861	100.00
-REMAINDER	12821	40	0	12861	99.68
SECOND GIVEN NAME-INITIAL	7	12854	0	12861	0.05
-REMAINDER	2	12859	0	12861	0.01
MAIDEN NAME - FEMALES	6	6834	0	6840	0.08
- MALES	1	6020	0	6021	0.01
- ESKIMO (MIF)	0	0	0	0	0.00
RESIDENCE - PROVINCE	12861	0	0	12861	100.00
~~- COUNTY~~	~~12844~~	~~17~~	0	~~12861~~	~~99.86~~
- SUBDIVISION	0	12861	0	12861	0.00
- TYPE	0	12861	0	12861	0.00
BIRTHPLACE - CONTINENT	0	12861	0	12861	0.00
- COUNTRY	0	12861	0	12861	0.00
- PROVINCE	0	12861	0	12861	0.00
- COUNTY	0	12861	0	12861	0.00
- SUBDIVISION	0	12861	0	12861	0.00
SEX	12861	0	0	12861	100.00
BIRTHDATE - YEAR	12856	5	0	12861	99.96
- MONTH	2062	10799	0	12861	16.03
- DAY	2052	10809	0	12861	15.95
MARITAL STATUS	3619	649	8593	12861	28.13
AGE	12861	0	0	12861	100.00
DIAGNOSIS	12861	0	0	12861	100.00
DATE-DIAG. - YEAR	0	0	12861	12861	0.00
- MONTH	1865	10996	0	12861	14.50
SHOP CODE	12859	2	0	12861	99.98
STATUS (DEAD AT NOTIF.)	0	12861	0	12861	0.00
V.S. INDICATOR	12861	0	0	12861	100.00
DEATH REG. - PROV.	883	11978	0	12861	6.86
- NUMBER	883	11978	0	12861	6.86
INSURANCE NUMBER	0	12861	0	12861	0.00

AS IN E, FOR BRITISH COLUMBIA ONLY.

Appendix F

THE UNIVERSITY OF BRITISH COLUMBIA
Faculty of Medicine

Department of Health Care and Epidemiology
Mather Building
5804 Fairview Avenue
Vancouver, B.C.
V6T 1W5

(604)228-2772

TO: Members of the Association of Nuclear Medicine

A planning committee (listed below) is exploring the possibility of conducting a large scale follow-up study of patients who have received diagnostic doses of radioactive iodine.

As you know, there is some controversy about the carcinogenic potential of I_{131} since although the 1980 study of Holm et al. found no excess thyroid cancers, the study group was relatively small (10,000 patients).

AECB (perhaps together with Health and Welfare Canada) are interested in the possibility of supporting a multi-centre Canadian study that would involve substantially larger numbers.

Preliminary estimates suggest that there may be something like 100,000 Canadians who received I_{131} before 1970. Their names could then be linked to the National Cancer Incidence Registry, to identify those who have developed thyroid cancer.

The purpose of this letter is to ask you:

(a) If you have access to records of any patients who received diagnostic doses of I_{131} before 1970 and if so, approximately how many records there might be.

(b) If you would be willing to participate in this study on the understanding that all the costs of data collection etc, would be borne by the main grant.

We also hope that a session can be arranged at the September meeting of the Association at which the proposal can be discussed. Meanwhile we would be pleased to receive any comments or queries.

We suggest that (assuming that the major study does go forward) the final report should not be ascribed to a few individual authors, but should be referred to as the "Canadian Collaborative Study" with a listing of all study participants.

I would appreciate hearing from you as soon as possible so that a reasonably firm estimate can be made of the total number of records that would be available. If possible I would appreciate a copy of the type of form(s) used in the period up to 1970.

With best wishes.

Yours sincerely,

T.W. Anderson, BM, BCh, PhD, FRCP(C)
Professor

Planning Committee: T.W. Anderson (Vancouver); K.Y. Gulenchyn (Ottawa); J.R. Johnson (Chalk River); B.C. Lentle (Edmonton); R.T. Morrison (Vancouver); D.K. Myers (Chalk River).